COMPUTER SERVICES PRICING STUDY

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Y-UNA
IP
CUSTOM
AUTHOR
Computer Services Pricing Study
TITLE

OFFICES

UNITED STATES

2180 Sand Hill Road
Suite 320
Menlo Park, CA 94025
(415) 854-3422

15 Bond Street
Great Neck, NY 11021
(516) 482-4170

JAPAN

Overseas Data Service Company, Ltd.
Shugetsu Building, No. 12-7 Kita Aoyama
3-Chome Minato-Ku
Tokyo, 107
Japan
(03) 400-7090

EUROPE

67A High Street
Sutton SM1 1DT
England

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2180 SAND HILL ROAD
MENLO PARK, CALIFORNIA

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I. INTRODUCTION

I. INTRODUCTION

- This report, produced by INPUT, is a custom study for the Computer and Communications Service Division of United Airlines (UAL).

- Its purpose is to obtain commercial computer services prices and then compare these commercial rates to UAL's internal computer services prices. The prices studied fall into seven categories, as listed below:

  - Personnel
  - IBM OS Resource Elements
  - Univac Resource Elements
  - Offline Support
  - Terminals
  - Specialty Services
  - Micrographics

- Another category, OS Online Services, is included in IBM OS Resource Elements.

- Research for this report has included contacting more than 80 computer services vendors, several government agencies, and a small number of users.

- Data from more than 20 companies were included in the final results.
- Interviews were conducted by telephone and by mail.

- Respondents included Grumman, McDonnell Automation, Boeing Computer Services, Computer Network, Computer Sciences, General Electric, Martin Marietta, United Computing Systems, National CSS, Control Data, Rapidata, and Tymshare.

- These commercial vendors' prices have been compared to UAL's in-house prices. In some cases, however, unique price units make comparison impossible. This is particularly true of mainframe and storage pricing.

- Where comparison was impossible, the commercial vendor prices have been defined as accurately as possible to facilitate comparison by the client's staff.

- Inquiries and comments from the client are welcomed.

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II. PERSONNEL

SERVICES CATEGORY: Personnel Charges: Applications Programmer

COMPANY *	PRICE	UNIT	PARAMETERS INCLUDES CPU TIME	G & A	OHD	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (21)	$200	Day	No	Yes	Yes	$200	100%	Small Batch Service Bureau
2 (50)	350	"	"	"	"		175	Medium Sized Multi-Service Vendor
3 (38)	184	"	"	"	"		92	Large Multi-Service Vendor
4 (13)	160	"	"	"	No		80	Medium Sized Multi-Service Vendor
5 (14)	160	"	-	-	-		80	Large Multi-Service Vendor
6 (20)	240	"	-	-	-		120	Large Multi-Service Vendor
7 (35)	160	"	No	Yes	Yes		80	Small Professional Services Vendor
8 (17)	168	"	"	"	"		84	Medium Sized Multi-Services Vendor
9 (31)	240	"	"	"	"		120	Small Software Vendor
10 (70)	120	"	"	"	No		60	Medium Sized RCS, T/S Vendor
11 (79)	200	"	"	-	Yes		100	Small Multi-Service Vendor
12 (77)	280	"	"	Yes	"		140	Large Specialty Remote Computing Vendor

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Personnel Charges: Systems Programmer

COMPANY *	PRICE	UNIT	PARAMETERS INCLUDES CPU TIME	G & A	OHD	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (21)	$200	Day	-	-	-	Not Available		See Applications Programmer Page 1.
2 (50)	385	"	No	Yes	Yes	(N/A)	N/A	" " "
3 (38)	184	"	"	"	No			" " "
4 (13)	160	"	-	-	-			" " "
5 (14)	160	"	-	-	-			" " "
6 (1)	246	"	-	-	-			Large Hardware & Interactive Services Vendor
7 (28)	224	"	-	-	-			Medium Sized Multi-Services Vendor
8 (35)	160	"	No	Yes	Yes			See Applications Programmer Page 1
9 (17)	168	"	"	"	"			" " "
10 (31)	240	"	"	"	"			" " "
11 (70)	144	"	"	"	No			" " "
12 (79)	200	"	"	-	Yes			" " "
13 (77)	280	"	"	Yes	"			" " "

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Personnel Charges: Test Programmer

COMPANY *	PRICE	UNIT	PARAMETERS INCLUDES CPU TIME	G & A	OHD	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (21)	$200	Day	-	-	-	$272	74%	See Applications Programmer Page 1.
2 (50)	295	"	No	Yes	Yes		108	" " "
3 (38)	184	"	"	"	No		68	" " "
4 (13)	160	"	-	-	-		59	" " "
5 (14)	160	"	-	-	-		59	" " "
6 (35)	160	"	No	Yes	Yes		59	" " "
7 (17)	168	"	"	"	"		62	" " "
8 (83)	180	"	-	-	-		66	Medium Sized Services Vendor
9 (31)	240	"	No	Yes	Yes		88	See Applications Programmer Page 1.
10 (70)	144	"	"	"	No		53	" " "
11 (79)	200	"	"	-	Yes		74	" " "
12 (77)	280	"	"	Yes	"		103	" " "

* Number in Parenthesis is Respondent Questionnaire Number.

III. RESOURCE ELEMENTS: IBM OS BATCH

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Mainframe

COMPANY *	PRICE	UNIT	PARAMETERS		UNITED AIR LINES		COMMENTS
			VENDOR	MODEL	PRICE	% UAL PRICE	
1 (38)	$.40	CPU Sec x A	IBM	370/168	.096791 per CPU Sec.	N/A	A = Formula Based on all Resource Elements
2 (14)	.042-.200	Resource Unit					Based on CPU Sec., Core Usage, File 1/0
3 (43)	N/A		IBM	370/155			See following pages for storage & peripheral charges.
4 (50)	6.75	Resource Unit	IBM	370/168			Based on CPU time, core usage, disk/tape usage, I/O time
5 (16)	97.00	Billing Unit Hour	IBM	370/168			

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Core

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)					N/A	Included in Mainframe Price
2 (14)						" "
3 (43)	$640	Systems Hour	385K - 512K	.000096 per 1000 units req.	362%	Comparison assumes UAL charges = .3456 per 1K core per hour.
	700	"	513K - 576K		352	
	760	"	577K or More		382	
4 (50)						Included in Mainframe Charges
5 (16)						Included in Mainframe Charges

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Card Punch

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)	$3.00	1000 Cards		.003524 per EXCP	N/A	UAL price is not comparable.
2 (43)	2.00	1000 Cards				
3 (50)	1.00	1000 Cards	Includes Mounting and Hardware			Average Price
4 (16)	4.00	1000 Cards				Itemized Price

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Card Reader

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)	$1.50	1,000 Cards		.000881 per EXCP	N/A	UAL prices are not comparable to vendor prices.
2 (43)	1.00	1,000 Cards				Average Price
3 (50)	1.00	1,000 Cards	Includes Mounting and Hardware			Average Price
4 (16)	1.15	1,000 Cards				Itemized Price

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Disk

COMPANY *	PRICE	UNIT	PARAMETERS				UNITED AIR LINES		COMMENTS
			SHARED	PRIV.	REMOV.	PERM.	PRICE	% UAL PRICE	
1 (38)	$ .05	Track/ Day	X-3360				.000961 per EXCP	N/A	Itemized Rates Include Mounting and Hardware
	.07	"		X-3350					UAL prices are not comparable to vendor prices.
	2,000.00	100 meg /mo.			X				
2 (43)	.03	Track/ Day	X		X				Averaged Prices Plus $5 Per Mount
	25.00	Pack/ Mo.	X		X				
3 (50)									Included in Mainframe Charges
4 (16)	1.00	3330 Cylinder Week				X			Itemized, Includes Mounting

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Printer

COMPANY *	PRICE	UNIT	PARAMETERS SPEED LOW	MEDIUM	HIGH	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (38)	$1.50	1000 Lines			X	.34 per 1000 Lines	441%	
2 (43)	1.00	1000 Lines			X		294%	Average Price
3 (50)	1.00	1000 Lines					294%	Average Price Includes Mounting and Hardware
4 (16)	1.40	1000 Lines					412%	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Batch-Tape

COMPANY *	PRICE	UNIT	PARAMETERS		UNITED AIR LINES		COMMENTS
			Drive	Reel	PRICE	% UAL PRICE	
1 (43)	1.00-2.00	Mount Month		X	.000401 per EXCP	N/A	UAL prices not comparable.
2 (50)							Included in Mainframe Charges
3 (16)	95.00	Tape Reel		X			Includes Mounting and Hardware Itemized Price

* Number in Parenthesis is Respondent Questionnaire Number.

IV. RESOURCE ELEMENTS: IBM OS REMOTE BATCH

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch-Mainframe

COMPANY *	PRICE	UNIT	PARAMETERS VENDOR	PARAMETERS MODEL	UNITED AIR LINES PRICE	UNITED AIR LINES % UAL PRICE	COMMENTS
1 (38)	$ .40	CPU Sec x A	IBM	370/168 TSO	$.096971 per CPU second	UAL price not comparable because of unique vendor resource factors.	A = Formula Based on All Resource Elements
2 (13)	.064	CPU Sec x B	IBM	360/65 TSO			B = CPU Sec x Memory Factor (Overnight Turnaround)
	.24	CPU Sec x B	IBM	360/65 TSO	TSO-		B = CPU Sec x Memory Factor (5 minute Turnaround)
3 (1)	.18 - 1.40	Billing Unit	IBM	370/X		"	Based on Resource Element Utilization
4 (30)	.80	CPU Sec	IBM	370/158		825%	Approximate Charges Prime Time
	.40	"	"	"		412%	Approximate Charges Non-prime Time
5 (20)	235.-300.	Resource Unit	IBM	370/X		UAL price not comparable.	Based on CPU Time; Channel, Memory, 1/O & Peripheral Usage
6 (43)	9.50	Resource Unit	IBM	370/168 TSO		"	With TSO; Unit Based on CPU, 1/O & Core Usage
7 (28)	Variable		IBM	370/158		"	Based on Priority, Core Requested, and Core Used
8 (50)	6.75	Resource Unit	IBM	370/168			See #4 IBM batch.
9 (16)							See #5 (16) IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch-Core

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)	$ .88	K-Byte Hour	TSO	$1.80 per core occupancy minute	Not comparable	
2 (13)						Included in Mainframe Charges
3 (1)	.013	Storage Unit/ Day				1280 Six-Bit Characters
4 (20)						Included in Mainframe Charges
5 (43)						Included in Mainframe Charges
6 (50)						Included in Mainframe Charges
7 (16)						See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch-Communications

COMPANY *	PRICE	UNIT	PARAMETERS				UNITED AIR LINES		COMMENTS
			CONNECT CHARGES	DED PORT	USER LINES	VENDOR LINES	PRICE	% UAL PRICE	
1 (38)	$ 8.00 - 40.00	Hour	X		X		TSO: $.116667 per clock minute(= $7/hr.)	114%-571%	
2 (13)	12.00	Hour	X		X	$10 Add.		143%	110-1200 Baud
3 (14)	.15	100 Records	X		X		100 per dedicated port	Not comparable	2000-4800 Baud
	.15	100 Records	X	X	X				4800,7200,9600 Baud Min: $1700-$2000/month
4 (1)	12.00	Hour	X		X			171%	2000-2400 Baud
	18.00	Hour	X		X			257%	4800 Baud
5 (20)	7.70 - 15.00	Hour + I/O	X			X		110%-214% without I/O	110-1200 Baud
	11.00-13.00	"	X			X		157%-186% without I/O	2000-4800 Baud
6 (43)	N/A								
7 (28)	7.00 - 11.00	Hour	X		X			100%-157%	10-30 CPS
	15.00	"	X		X			214%	2000 CPS
8 (50)									Included in mainframe charges
9 (16)									See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch-Card Punch

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)	$1.50	1000 Cards		$.003524 per EXCP	Not comparable	
2 (13)	.001408	I/0 x B			"	B = Memory Factor (Overnight Response)
	.00528	I/0 x B			"	B = Memory Factor (5 Minute Response)
3 (20)	3.50	1000 Cards			"	
4 (43)	1.65	1000 Cards			"	Average Price
5 (50)	1.00	Resource Unit			"	Average price includes mounting & hardware.
6 (16)					"	See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: RESOURCE ELEMENTS: IBM OS REMOTE BATCH-CARD READER

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)	$1.50	1000 Cards		$.000881 per EXCP	Not comparable	
2 (13)	.001408	I/O x B			"	B = Memory Factor (Overnight Response)
	.00528	I/O x B			"	B = Memory Factor (5 Minute Response)
3 (20)	1.75	1000 Cards			"	
4 (43)	1.65	1000 Cards			"	Average Prices
5 (50)	1.00	Resource Unit			"	Average price includes mounting & hardware.
6 (16)					"	See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch-Disk

COMPANY *	PRICE	UNIT	PARAMETERS SHARED	PRIVATE	REM.	PERM.	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (38)	$ .05	Track/ Day	3360				$.000961 per EXCP	Not comparable	Itemized Rates; Include Mounting and Hardware
	.07	Track/ Day		3350					
	2000.00	Month			100 meg				
2 (13)	.001408	I/O x B							B = Memory Factor (Overnight Response)
	.00528	I/O x B							B = Memory Factor (5 Minute Response)
3 (20)	75.00	Month		X	3336				Plus $3 per Mount
	30.00	Month		X	2316				Plus $3 per Mount
4 (43)	20.00	Cylinder /Month		X	X				Average Prices
	40.00	Pack/Mo.							
5 (50)									Included in mainframe prices
6 (16)									See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch-Printer

COMPANY *	PRICE	UNIT	PARAMETERS SPEED LOW	MEDIUM	HIGH	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (38)	$1.50	1000 Lines			X	$.34 per 1000 lines	441%	
2 (13)	.001408	I/0 x B					Not comparable	B = Memory Factor (Overnight Response)
	.00528	I/0 x B					"	B = Memory Factor (5 Minute Response)
3 (20)	1.75	1000 Lines					515%	
4 (43)	1.50	1000 Lines			X		441%	Average Price Plus $2 Per Mount
5 (50)	1.00	Resource Unit						Includes mounting & hardware. Average price.
6 (16)								See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Remote Batch—Tape

COMPANY *	PRICE	UNIT	PARAMETERS DRIVE	PARAMETERS REEL	UNITED AIR LINES PRICE	UNITED AIR LINES % UAL PRICE	COMMENTS
1 (13)	$ .001408	I/0 x B		X	$.000401 per EXCP	Not comparable	B = Memory Factor (Overnight Response)
	.00528	I/0 x B		X			B = Memory Factor (5 Minute Response)
2 (1)	.20	Day		X			Vendor Supplied - Includes Mounting
	.10	Day		X			User Supplied- Includes Mounting
3 (20)	5.00	Month		X			Plus $1 per Mount
4 (43)	5.50	Month		X			Average Price; Plus $2 Mount
5 (50)							Included in mainframe charges
6 (16)							See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

V. RESOURCE ELEMENTS: IBM OS INTERACTIVE

SERVICES CATEGORY: Resource Elements: IBM OS Interactive: Mainframe

COMPANY *	PRICE	UNIT	PARAMETERS		UNITED AIR LINES		COMMENTS
			VENDOR	MODEL	PRICE	% UAL PRICE	
1 (38)	$ .40	CPU Sec x A_1	IBM	370/168	N/A	N/A	A_1 = 4 times formula for (38) batch and remote batch.
2 (13)	.24	CPU Sec x B	IBM	360/65			B = CPU x Memory (24 hours/ day)
3 (14)	.20-.43	Resource Unit	IBM	370/X			Based on CPU sec, core usage, file I/O.
4 (1)	.35	Billing Unit					Based on resource utilization.
5 (30)	1.20	CPU Sec	IBM	370/158			Approximate charges.
6 (43)	.39	CPU Sec	IBM	370/155			Plus 1.65 per 1000 I/O.
7 (28)	.29-.58	CPU Sec	IBM	370/158			Dependent on time of day.
8 (50)	8.00	Resource Unit	IBM	370/168			Based on CPU time, core I/O.
9 (16)							See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive: Core

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (38)			TSO	N/A	N/A	Included in mainframe utilization price.
2 (14)						" "
3 (1)	$ .03	Storage unit per day				1280 six-bit characters = one storage unit
4 (30)	.075	Storage unit per day				3400 bytes of permanent auxilliary storage.
5 (43)	N/A		TSO			
6 (28)	1.25	Hour	for ea. increment of 64K bytes above 320K of standard allotment.			
7 (50)						Included in mainframe charge
8 (16)						See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive-Communications (1 of 2)

COMPANY *	PRICE	UNIT	PARAMETERS				UNITED AIR LINES		COMMENTS
			CONNECT CHARGES	DED PORT	USER LINES	VENDOR LINES	PRICE	% UAL PRICE	
1 (14)	$ 4.50-16.00	Hour	X		X		$7.00/ clock hr.	64-229%	50-300 Band
	6.75-30.00	"	X		X			96-429	1200 Band
	15.00-30.00	"	X			X		214-429	110-300 Band
	420.00-2550.00	Month	X	X			$1120/Mo. (8 hr day, 20 day mo)	37-228	110-300, 1200 Band
2 (1)	9.00	Hour	X		X			129	100-300 Band
	8.00	Hour	X		X			114	2000-2400 Band
3 (30)	11.00-16.00	Hour	X		X			157-229	10-120 CPS
	18.00	Hour	X		X			257	2000-4800 Band
4 (20)	300.00	Month + I/0	X			X		27 without I/0	110-300, 1200 Band
5 (43)	10.00	Hour	X		X			143	
6 (28)	7.00-9.00	Hour	X		X			100-129	10 CPS - 30 CPS Terminals
	15.00	Hour	X		X			214	2000 bps. or Medium Speed Terminal

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive-Communications (2 of 2)

COMPANY *	PRICE	UNIT	PARAMETERS				UNITED AIR LINES		COMMENTS
			CONNECT CHARGES	DED PORT	USER LINES	VENDOR LINES	PRICE	% UAL PRICE	
7 (50)	$11.00	Hour	X		X				
8 (16)	3.80	Hour	X			X			
	28.25	CPU Min	X			X			TSO. Includes peripheral charges.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive: Card Punch

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (13)	$.00528	I/O x B		N/A	N/A	B = memory factor.
2 (14)						Included in mainframe charges.
3 (20)	3.50	1000 cards				
4 (28)	3.00	1000 cards				
5 (50)	1.00	Resource Unit				Average price includes mounting and hardware.
6 (16)						Included in communications charges.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive: Card Reader

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (13)	$.00528	I/O x B		N/A	N/A	B = memory factor
2 (14)						Included in mainframe charges
3 (20)	1.75	1000 cards				
4 (28)	1.00	1000 cards				
5 (50)	1.00	Resource Unit				Average price includes mounting and hardware.
6 (16)						Included in communications charges.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: RESOURCE ELEMENTS: IBM OS INTERACTIVE DISK

COMPANY *	PRICE	UNIT	PARAMETERS SHARED	PRIVATE	REM.	PERM.	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (13)	$ .00528	I/0 x B					N/A	N/A	B = Memory Factor
2 (14)									Included in Mainframe Charges
3 (20)	75.00	Month		X	3336				Plus $3 per Mount
	30.00	Month		X	2316				
4 (28)	10.00	Month			X				User supplied
	45.00	Month	X		X				Vendor Supplied
5 (50)	1.00	Resource Unit							Average price includes mounting and hardware.
6 (16)	1.00	3330 cylinder week				X			Included in communications charges.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive: Printer

COMPANY *	PRICE	UNIT	PARAMETERS SPEED LOW	PARAMETERS SPEED MED	PARAMETERS SPEED HIGH	UNITED AIR LINES PRICE	UNITED AIR LINES % UAL PRICE	COMMENTS
1 (13)	$.00528	I/O x B				N/A	N/A	B = memory factor.
2 (14)								Included in mainframe charges.
3 (20)	1.75	1000 lines						One part paper.
4 (28)	1.00	1000 lines						One part paper.
5 (50)	1.00	Resource Unit						Average price includes mounting and hardware.
6 (16)								Included in communications charges.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive: Tape

COMPANY *	PRICE	UNIT	PARAMETERS		UNITED AIR LINES		COMMENTS
			DRIVE	REEL	PRICE	% UAL PRICE	
1 (13)	$.00528	I/O x B		X	N/A	N/A	B = memory factor (24 hours/ day)
2 (14)							Included in mainframe charges
3 (1)	.20	Day + $30		X			Vendor supplied.
	.10	Day + $30		X			User supplied plus $2 per mount.
4 (20)	5.00	Month		X			Plus $1 per mount.
5 (28)	4.50	Month		X			User supplied
	6.00	Month		X			Vendor supplied plus $2 per mount.
6 (50)	1.00	Resource Unit					Average price includes mounting and hardware.
7 (16)							See IBM batch.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive-Applications

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (16)	$ 2.40	DL/1 1000 Calls	IMS			
	6.60	1000 Waits				
	9.40	CPU Min.				

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: IBM OS Interactive-Text Editing

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (43)	$ 6.00	CPU Min.				Wylbur
2 (16)	3.50	Connect Hour	ATS			User pays for terminal and user modem.
	46.16	Storage	1/4 track 1,00 week			

* Number in Parenthesis is Respondent Questionnaire Number.

VI. RESOURCE ELEMENTS: UNIVAC BATCH

SERVICES CATEGORY: Resource Elements: Univac Batch-Mainframe

COMPANY *	PRICE	UNIT	PARAMETERS VENDOR	PARAMETERS MODEL	UNITED AIR LINES PRICE	UNITED AIR LINES % UAL PRICE	COMMENTS
1 (79)	$ .30	Resource Unit	Univac	1108	.163782 per CPU Second	Not comparable	Prices for Univac Remote Batch and Univac Interactive are the same as those for Univac Batch.
	.20	CPU Time	Univac	1100/11		" "	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: Univac Batch-Core

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (79)	N/A					

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: RESOURCE ELEMENTS: UNIVAC BATCH-CARD PUNCH

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (79)	$4.00	1000 Cards	On-site or branch location	N/A		Includes mounting & hardware.
	No charge		Remote Dial-up			

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: Univac Batch-Card Reader

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (79)	$1.00	1000 Cards	On-Site or branch location	N/A		Includes Mounting and Hardware
		No Charge	Dial-up Remote			

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: Univac Batch-Printer

COMPANY *	PRICE	UNIT	PARAMETERS LOW	PARAMETERS MEDIUM	PARAMETERS HIGH	UNITED AIR LINES PRICE	UNITED AIR LINES % UAL PRICE	COMMENTS
1 (79)	$25.00	Hour			X	N/A		Includes hardware.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Resource Elements: Univac Batch-Tape

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (79)	$1.00	Unit		N/A		Includes Mounting and Hardware

* Number in Parenthesis is Respondent Questionnaire Number.

VII. OFFLINE SUPPORT

SERVICES CATEGORY: Offline Support: Bursting/Decollating

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (43)	$20	Hour		$8/Hr.	250%	Bursting $10; Decollation $10
2 (50)	30	"			375	
3 (13)	20	"			250	
4 (14)	28	"			350	
5 (84)	5	"			63	
6 (79)	9	"			113	
7 (77)	7	"			88	
8 (83)	10	"	Decollation Only		Not Comparable	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Offline Support: Keypunch and Verify

COMPANY *	PRICE	UNIT	PARAMETERS INCLUDES DATA ENTRY	PARAMETERS INCLUDES NO DATA ENT.	UNITED AIR LINES PRICE	UNITED AIR LINES % UAL PRICE	COMMENTS
1 (43)	$10.00	Hour	X		$17/Hr.	59%	
2 (50)	9.75	"	X			57	
3 (50)	8.75	"		X		51	
4 (16)	13.50	"	X			79	
5 (79)	9.00	"	X			53	
6 (77)	7.00	"	X			41	
7 (53)	.13	Card		X		N/A	Not Comparable

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Offline Support: Magnetic Tape Reader

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (83)	.005	CARD		$ 22/Hr.	N/A	Few Vendors Itemized Tape Reader Services; Prices are not Comparable
2 (13)	No Charge					

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Offline Support: Miscellaneous

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
			TYPE OF SERVICE	PRICE	% UAL PRICE	
			Source Document Filming			
1 (50)	$16.50	1000 Frames		$11.26 per 1000	147%	
			IBM 360/20			
1 (50)	$60	Hour		$21 hour	286%	
2 (16)	50	"			238%	
			IBM 7074			
1 (77)	$ .40	CPU Sec		$1.67 per clock minute	N/A	Prices Not Comparable. Plus $12/connect hour.
			IBM 1401			
						No prices available.
			Scanner Operations			
1 (53)	$3.50-4.05	1000 Lines		$70/Hr.	N/A	No prices available.

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Offline Support: Printing

COMPANY *	PRICE	UNIT	PARAMETERS SPEED LOW	MEDIUM	HIGH	UNITED AIR LINES PRICE	% UAL PRICE	COMMENTS
1 (83)	$ .20	Page			X		1267%	One part forms only.
2 (83)	.05	"		X		$.015789	317	
3 (43)	30.00	Hour			X	Per Page	N/A	
4 (79)	25.00	"	X	X	X		N/A	Multi-part forms have higher rates.
5 (50)	140.00	"		X			N/A	
6 (14)	2.40	1000 Lines		X			N/A	Prices are not comparable.
7 (1)	1.75	"		X			"	
8 (28)	1.00	"		X			"	
9 (83)	1.25-2.50	"	X	X	X		"	
10 (84)	1.25	"			X		"	
11 (13)	.50			X	X		"	

* Number in Parenthesis is Respondent Questionnaire Number.

VIII. TERMINALS

SERVICES CATEGORY: Terminals: CRT

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (53)	$3500-4000	Purchase	NCR 796	N/A		
2 (59)	75	Mo.	Lear Siegler 430	121/Mo. for general CRT	62%	
3 (59)	110	"	Lear Siegler 420		91	
4 (70)	378	"	Incoterm SPD 10/20 w/P-120 printer		312	
5 (70)	457	"	Incoterm SPD 10/20 w/P-165 printer		378	
6 (70)	521	"	Incoterm SPD 10/20 w/LP-125		431	
7 (70)	655	"	Incoterm SPD 10/20 w/LP-250		541	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Terminals: Teleprinter

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (53)	$6000	Pur-chase	NCR 260-6	N/A		
2 (59)	80	Mo.	Teletype ASR 33	N/A		
3 (59)	198	"	Diablo 1620	N/A		
4 (59)	75	"	TI Silent 700	$124 Mo.	60%	
5 (59)	150	"	Decwriter II	102 Mo.	147	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Terminals: Text Editor

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (70)	$223	Mo.	Incoterm SPD 10/20	N/A	N/A	
2 (70)	103	"	Incoterm SPD 250	80/Mo.	154%	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Remote Batch

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (53)	$4400	Purchase	NCR 250	N/A		
2 (53)	4000	"	NCR 280	"		
3 (53)	2800	"	NCR 7218	"		
4 (70)	1675	Month	Univac WTS 700	"		
5 (79)	600	Month	Univac 1204	"		

* Number in Parenthesis is Respondent Questionnaire Number.

IX. SPECIALTY SERVICES

SERVICES CATEGORY: Specialty Services

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (77)	$ .13	Undup. Pass Board	Airline	.008935	1,454%	
2 (77)	2.50	Reserv.	Lodging	"	27,979	
3 (77)	.30	Flight Leg	Flight Planning	.055026	545	

* Number in Parenthesis is Respondent Questionnaire Number.

X. MICROGRAPHICS

SERVICES CATEGORY: Micrographics: Microfiche: Original

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (62)	$.01-.02	Fiche	Silver - 105 mm.	$1.741282 per Fiche	.57 - 1.15%	This category of prices is heavily volume dependent.
2 (50)	1.50	"			86	
3 (14)	3.00	"			172	
4 (20)	.50	"			29	
5 (53)	2.25-4.00	"			129 - 230	Averaged prices.
6 (16)	.30	"			17	
7 (63)	2.50	"			144	
8 (77)	.025	"			1.44	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Micrographics: Microfiche: Duplicate

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (62)	$.01-.02	Fiche	Diazo - 105 mm.	$.069760 per fiche	14 - 27%	
2 (50)	.40	"			573	
3 (14)	.35	"			502	
4 (20)	.35	"			502	
5 (53)	.19	"			272	
6 (16)	.30	"			430	
7 (63)	.15	"			215	
8 (77)	.15	"			215	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Micrographics: Microfilm: Originals

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (62)	$.01-.02	Frame	Silver 16 mm.	$.008490	118 - 236%	This category of prices is heavily volume dependent.
2 (50)	.06	"			707.0	
3 (20)	.02	"			236.0	
4 (16)	.40	"			4711.0	
5 (63)	.015	"			177.0	
6 (77)	.025	"			294.0	
1 (50)	$ .07	"	Silver 35 mm.	$.009630	727%	This category of prices is heavily volume dependent.
2 (16)	.12	"			1246	

* Number in Parenthesis is Respondent Questionnaire Number.

SERVICES CATEGORY: Micrographics: Microfilm: Duplicates

COMPANY *	PRICE	UNIT	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% UAL PRICE	
1 (62)	$.001-.002	Frame	Diazo - 16 mm.	$.006298	16 - 32%	
2 (50)	.06	"			953	
3 (20)	.003	"			48	
4 (16)	.40	"			6351	
5 (63)	.001	"			16	
6 (77)	5.00	roll plus cartridge			N/A	Prices not comparable.

* Number in Parenthesis is Respondent Questionnaire Number.

COMPANY *	TERMS	DATE	PARAMETERS	UNITED AIR LINES		COMMENTS
				PRICE	% DAL PRICE	
1 (63)	8.00-100.0	2/2000	Diam - 16 mm.	$.0005256	16 - 32%	
2 (70)	60	"			95%	
3 (80)	100	"			46	
4 (84)	40	"			4791	
5 (87)	100	"			22	
6 (77)	2.00	[illegible]			N/A	Prices not comparable.